

Amendments to the Claims

This listing of claims replaces all prior versions, and listings, of claims in the above-identified application:

1. **(Currently Amended)** A polycrystalline translucent aluminum oxide ceramic material having an average grain size of no greater than 1.0 micron as measured on a polished surface and a Contrast Ratio value of less than about 0.7.
2. **(Original)** The polycrystalline translucent ceramic material of claim 1 wherein no greater than 10% of the grains of a polished surface of the material has a largest dimension greater than 1.0 micron.
3. **(Original)** The polycrystalline translucent ceramic material of claim 1 having a wet transmittance of at least about 40% at about 550 nm.
4. **(Original)** The polycrystalline translucent ceramic material of claim 3 having a wet transmittance of at least about 50% at about 650 nm.
5. **(Original)** The polycrystalline translucent ceramic material of claim 1 wherein a wet transmittance curve over a range of about 475 nm to about 650 nm has an integrated area of greater than about 70%T-nm.
6. **(Original)** The polycrystalline translucent ceramic material of claim 1 wherein the material has a Contrast Ratio value of less than about 0.5.

7. **(Original)** The polycrystalline translucent ceramic material of claim 6 wherein the material has a Contrast Ratio value of less than about 0.4.
8. **(Original)** The polycrystalline translucent ceramic material of claim 1 having a flexure strength of at least about 400 MPa.
9. **(Original)** The polycrystalline translucent ceramic material of claim 8 having a flexure strength of at least about 600 MPa.
10. **(Original)** The polycrystalline translucent ceramic material of claim 1 having a purity of at least about 99.5 wt-%.
11. **(Original)** The polycrystalline translucent ceramic material of claim 10 comprising up to about 0.5 wt-% of magnesium oxide, yttrium oxide, zirconium oxide, hafnium oxide, calcium oxide, or combinations thereof.
12. **(Original)** The polycrystalline translucent ceramic material of claim 1 wherein the material is in the form of a dental article, an infrared radar dome, a sodium vapor lamp envelope, a window, or military armor.
13. **(Original)** The polycrystalline translucent ceramic material of claim 12 wherein the material is in the form of a dental article.
14. **(Original)** The polycrystalline translucent ceramic material of claim 13 wherein the dental article is a dental prosthesis.

15. **(Original)** The polycrystalline translucent ceramic material of claim 14 wherein the dental prosthesis is selected from the group consisting of a crown, a coping, a bridge framework, a dental implant, a dental implant abutment, an inlay, an onlay, and a veneer.
16. **(Original)** A dental mill blank comprising a polycrystalline translucent aluminum oxide ceramic material having an average grain size of no greater than 1.0 micron and a Contrast Ratio value of less than about 0.7.
17. **(Original)** The dental mill blank of claim 16 wherein the blank is mounted to a holder selected from the group of a stub, a frame, a collett, and a plate.
18. **(Original)** The dental mill blank of claim 16 wherein the ceramic material has a tooth-like shade.
19. **(Original)** The dental mill blank of claim 16 wherein no greater than 10% of the grains of a polished surface of the ceramic material has a largest dimension greater than 1.0 micron.
20. **(Original)** The dental mill blank of claim 16 wherein the ceramic material has a wet transmittance of at least about 40% at about 550 nm.
21. **(Original)** The dental mill blank of claim 20 wherein the ceramic material has a wet transmittance of at least about 50% at about 650 nm.
22. **(Original)** The dental mill blank of claim 16 wherein a wet transmittance curve of the ceramic material over a range of about 475 nm to about 650 nm has an integrated area of greater than about 70%T-nm.

23. **(Original)** The dental mill blank of claim 16 wherein the ceramic material has a Contrast Ratio value of less than about 0.5.
24. **(Original)** The dental mill blank of claim 23 wherein the ceramic material has a Contrast Ratio value of less than about 0.4.
25. **(Original)** The dental mill blank of claim 16 wherein the ceramic material has a flexure strength of at least about 400 MPa.
26. **(Original)** The dental mill blank of claim 25 wherein the ceramic material has a flexure strength of at least about 600 MPa.
27. **(Original)** The dental mill blank of claim 16 wherein the ceramic material has a purity of at least about 99.5 wt-%.
28. **(Original)** The dental mill blank of claim 16 wherein the ceramic material comprises up to about 0.5 wt-% of magnesium oxide, yttrium oxide, zirconium oxide, hafnium oxide, calcium oxide, or combinations thereof.
29. **(Original)** A ceramic dental prosthesis comprising a polycrystalline translucent aluminum oxide ceramic material having an average grain size of no greater than 1.0 micron and a Contrast Ratio value of less than about 0.7.
30. **(Original)** The prosthesis of claim 29 wherein the ceramic material is coated at least partially with an aesthetic coating material selected from the group consisting of porcelain,

glass, glass-ceramic, composite, resin ceramic composite, and combinations thereof.

31. **(Original)** The prosthesis of claim 29 wherein the prosthesis is attached to tooth structure with dental cement.
32. **(Original)** The prosthesis of claim 29 wherein no greater than 10% of the grains of a polished surface of the ceramic material has a largest dimension greater than 1.0 micron.
33. **(Original)** The prosthesis of claim 29 wherein the ceramic material has a wet transmittance of at least about 40% at about 550 nm.
34. **(Original)** The prosthesis of claim 29 wherein the ceramic material has a wet transmittance of at least about 50% at about 650 nm.
35. **(Original)** The prosthesis of claim 29 wherein a wet transmittance curve of the ceramic material over a range of about 475 nm to about 650 nm has an integrated area of greater than about 70%T-nm.
36. **(Original)** The prosthesis of claim 29 wherein the ceramic material has a Contrast Ratio value of less than about 0.5.
37. **(Original)** The prosthesis of claim 36 wherein the ceramic material has a Contrast Ratio value of less than about 0.4.
38. **(Original)** The prosthesis of claim 29 wherein the ceramic material has a flexure strength of at least about 400 MPa.

39. **(Original)** The prosthesis of claim 38 wherein the ceramic material has a flexure strength of at least about 600 MPa.
40. **(Original)** The prosthesis of claim 29 wherein the ceramic material has a purity of at least about 99.5 wt-%.
41. **(Original)** The prosthesis of claim 29 wherein the ceramic material comprises up to about 0.5 wt-% of magnesium oxide, yttrium oxide, zirconium oxide, hafnium oxide, calcium oxide, or combinations thereof.
42. **(Original)** A kit comprising:
a dental mill blank comprising a polycrystalline translucent aluminum oxide ceramic material having an average grain size of no greater than 1.0 micron and a Contrast Ratio value of less than about 0.7; and
instructions for using the mill blank.
43. **(Original)** The kit of claim 42 further comprising a component selected from the group consisting of a bonding agent, a milling lubricant, a color-matching composition suitable for use in the oral environment, an impression material, an instrument, a dental composite, a dental porcelain, an abrasive, and combinations thereof.
44. **(Withdrawn – Currently Amended)** A method for making a polycrystalline translucent aluminum oxide ceramic material having a grain size of no greater than 1.0 micron as measured on a polished surface and a Contrast Ratio value of less than about 0.7, the method comprising:
providing an aluminum oxide powder;

forming the powder into an article having a desired shape;
sintering the shaped article to obtain a sintered article having closed porosity; and
subjecting the sintered article to hot isostatic pressing to further densify and form a densified article comprising polycrystalline translucent aluminum oxide ceramic material having a grain size of no greater than 1.0 micron as measured on a polished surface and a Contrast Ratio value of less than about 0.7.

45. **(Withdrawn)** The method of claim 44 further comprising deagglomerating the aluminum oxide powder prior to forming the powder into an article having a desired shape.

46. **(Withdrawn)** The method of claim 45 wherein deagglomerating the aluminum oxide powder comprises subjecting the aluminum oxide powder to ultra-sonication.

47. **(Withdrawn)** The method of claim 44 wherein subjecting the sintered article to hot isostatic pressing comprises subjecting the sintered article to hot isostatic pressing at a temperature of about 1200°C to about 1300°C for about 30 minutes to about 120 minutes under about 100 MPa to about 210 MPa of an inert gas.

48. **(Withdrawn)** The method of claim 44 wherein forming the powder into an article having a desired shape comprises forming a mill blank comprising ceramic material in a green stage.

49. **(Withdrawn)** The method of claim 48 further comprising carving the green-stage mill blank into a desired shape prior to sintering the shaped article to obtain a sintered article having closed porosity.

50. **(Withdrawn)** The method of claim 44 further comprising carving the sintered article having closed porosity into a desired shape prior to subjecting the sintered article to hot isostatic pressing to further densify.
51. **(Withdrawn)** The method of claim 44 further comprising carving the densified article into a desired shape.
52. **(Withdrawn)** The method of claim 44 wherein forming the powder into an article having a desired shape comprises slurry casting the aluminum oxide powder.
53. **(Withdrawn)** The method of claim 44 wherein forming the powder into an article having a desired shape comprises injection molding the aluminum oxide powder.
54. **(Withdrawn)** The method of claim 44 wherein the aluminum oxide powder has a surface area of greater than about $10 \text{ m}^2/\text{g}$.
55. **(Withdrawn)** The method of claim 54 wherein the aluminum oxide powder has a surface area of greater than about $14 \text{ m}^2/\text{g}$.
56. **(Withdrawn)** The method of claim 44 wherein the aluminum oxide powder has a purity of at least about 99.5%.
57. **(Withdrawn)** The method of claim 44 wherein the densified article is a dental mill blank.
58. **(Withdrawn)** The method of claim 44 wherein the densified article is a dental prosthesis.

59. **(Withdrawn)** A method for making a dental prosthesis comprising:
- providing a dental mill blank comprising a polycrystalline translucent aluminum oxide ceramic material having a grain size of no greater than 1.0 micron and a Contrast Ratio value of less than about 0.7; and
 - carving the mill blank into a desired shape.
60. **(Withdrawn)** The method of claim 59 further comprising attaching the carved blank to tooth or bone structure.
61. **(Withdrawn)** The method of claim 60 wherein the carved blank is attached to the tooth or bone structure with a color-matching bonding agent.